Andrei Krokhotine (ITEP)

Jet Energy Corrections (Jet Rates)

$(L = 2 \times 10^{33} cm^{-2} s^{-1})$

Methods to calculate rate:

- Method A (proposed by James G. Branson and Eliane Trepagnier): we have N_{bin} bins in $\hat{P}_T$ and a given crossing has $(n1, n2, ..., n_{N_{bin}}) = n$. Then the number of such type of events (given by n) was counted in all hlt samples and scaled to give a rate of such events. So that weighting coefficients W(n) were different for different types of events (i.e.for different n). But... information about n is not available, so that W(n) were averaged over all events in each hlt bin.
- Method B:
  $W_i = \frac{L*\sigma_i}{N_i}$, where N_i - the number of events in bin i. (CMS Internal Note of S.Eno and P.Sphicas)

Data Set	N events	method A :*	method B:
hlt010	99754	181.297	872.145
hlt1015	95546	85.945	185.627
hlt1520	128361	22.455	28.887
hlt2030	164500	8.459	9.506
hlt3050	184041	1.9400	2.0093
hlt5080	108030	0.4460	0.4504
hlt80120	136532	0.04914	0.04920
hlt120170	48000	0.02354	0.02355
hlt170230	9500	0.0244667	0.0244842
hlt230300	19000	0.0029596	0.0029599
hlt300380	8000	0.0019623	0.0019624
hlt380470	7999	0.00060004	0.00060007

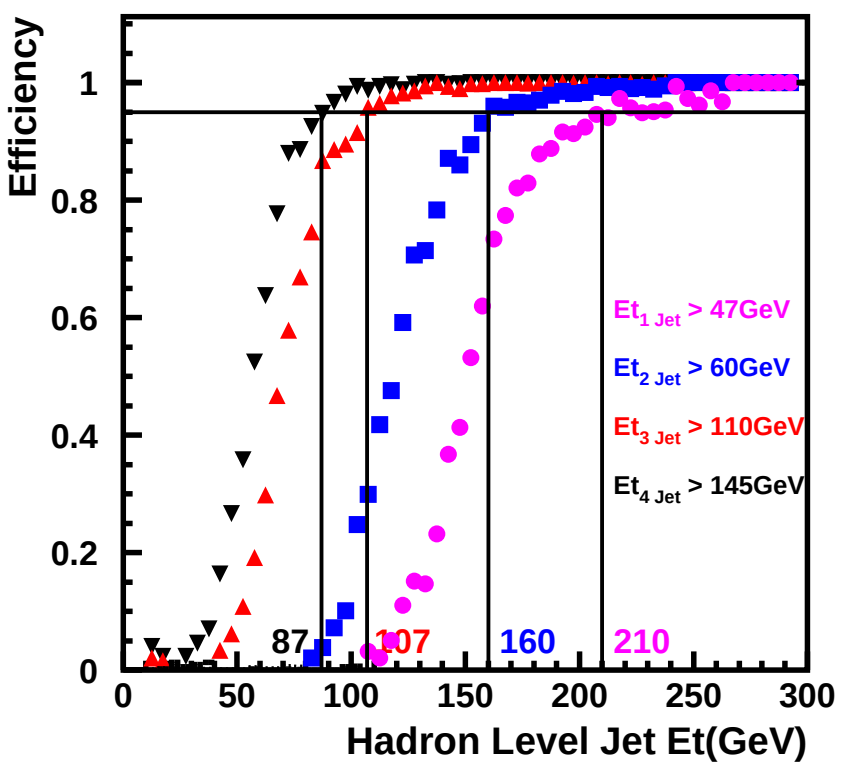
Weights are different only in low Pt bins.

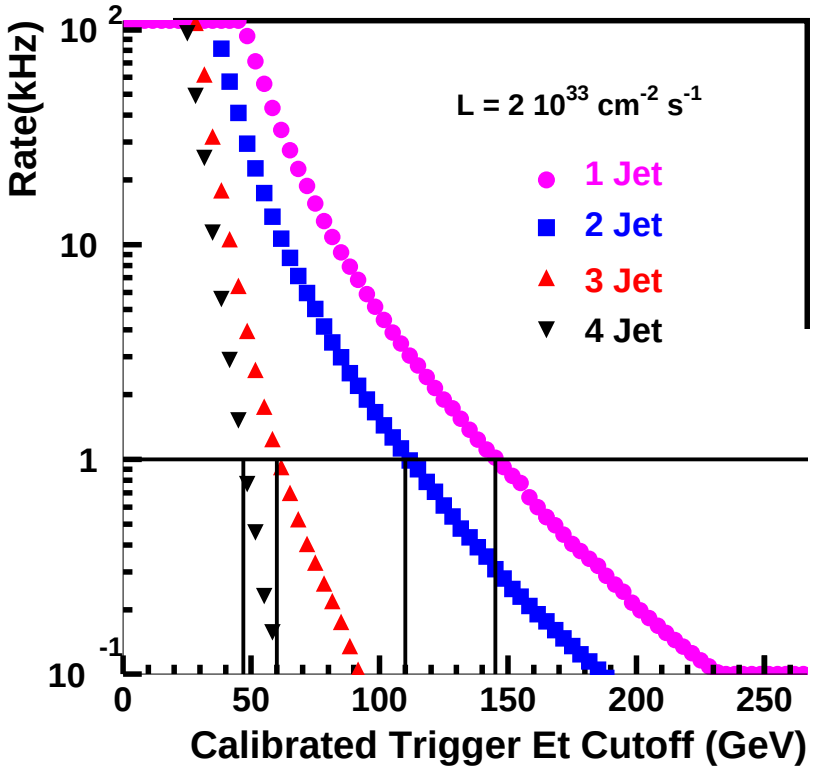
But.. Do we really need these bins?

- $< N >= 3.45 \rightarrow$ L1 jets don't come from overlapping of min.bias events. (even for $< N >= 17.3, E_t$ of rec jets (not L1 jets) $<$ 40GeV)
- Inclusion of low Pt bins leads to double counting. e.g. there are 1152 events with $30GeV < \hat{P}_t < 50GeV$ in hlt010, they are counted with weight which is at 93.5 times higher than for the same events coming from hlt5080. it overestimates rates from this type of events at 1.8 times.

*** method A: weights are calculated with method of James G.Branson and Eliane Trepagnier**

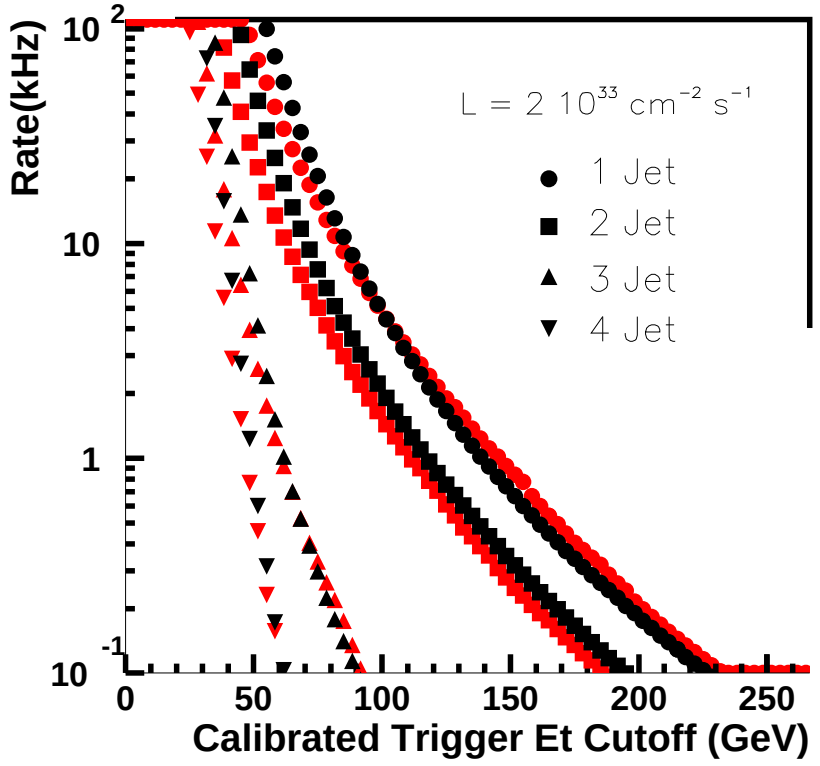
Rates $L = 2 \times 10^{33} cm^{-2} s^{-1}$





Rates, Comparison between Hadron Level Jets and L1 jets.

$(L = 2 \times 10^{33} cm^{-2} s^{-1})$



Black histograms - Hadron Level Jets

Red histograms - L1 Jets

Summary:

- Rates were calculated using average weights on hlt bins.
- Weights calculated by two different methods were compared
- To calculate rates in more correct way we need information on $\hat{P}_t$ of all events in each bunch-crossing.